

REMARKS

I. STATUS OF THE CLAIMS

Prior to the above amendment, claims 1-26 were pending. Without prejudice or disclaimer, claims 13, 15, and 16 have been amended. Claims 27 and 28 are new. Upon entry of the above amendment, claims 1-28 are pending.

Claim 13 has been amended to clarify that the definition for integer "n" is from 1 to 6. Claim 13 depends directly from claim 12. As recited in claim 12, "each of R² and R³ independently represent a linear or branched C₁-C₁₀ alkyl, optionally substituted. . . ." Claim 13 discloses an R² and R³ moiety with a substituted (CH₂)_n structure. Since claim 13 depends from claim 12, the integer "n" selected in claim 13 must be at least 1 (*i.e.*, a C₁ alkyl). For at least that reason, the amendment to claim 13 simply corrects an obvious typographical error, and is fully supported by the claims and as-filed specification.

Claim 15 has been amended to correct an obvious typographical error by replacing the term "N,N'-esan-1,6-diilbis[3,5-di-(ter-butyl-4-hydroxyphenyl) propionamide]" with "N,N'-hexane-1,6-diylbis [3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionamide]." Applicants submit that support for the amendment to claim 15 can be found throughout the as-filed specification, as the term "N,N'-hexane-1,6-diylbis [3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionamide]" represents the chemical name for the molecular formula of Irganox® 1098.

Claim 16 has been amended to correct an obvious typographical error by replacing the term "poli L-aminoacid" with the term "poly-L-amino acid."

New claims 27 and 28 find support, for example, in the as-filed specification from page 17, line 1 to page 20, line 25, including Tables 1 and 2.

Accordingly, Applicants submit that the amendments and new claims raise no issues of new matter.

II. RESPONSE TO CLAIM REJECTIONS

The Office now rejects claims 1-26 under 35 U.S.C. § 103(a), as allegedly being unpatentable over U.S. Patent No. 6,577,796¹ and PCT Publication WO 00/21098 to Anelli (collectively "Anelli") in view of U.S. Patent No. 5,134,036 to Uemura et al. ("Uemura") and U.S. Patent No. 5,187,226 to Kamachi et al. ("Kamachi"). See Office Action, pages 2-5. In essence, the Office has withdrawn its rejection of the pending claims in view of Snow et al. ("Snow"), and repeated its January 25, 2008 rejection, which was overcome April 24, 2008. Applicants object to this repetition of an earlier rejection that makes no attempt to address any of the extensive arguments provided by Applicants to overcome that earlier rejection, as unfair and inconsistent with the requirements of M.P.E.P. § 707.07(f). See also, M.P.E.P. § 707.14(b).

In particular, the Office alleges that Anelli discloses a telecommunications cable comprising, *inter alia*, a water-soluble polymer material such as a vinyl alcohol/vinyl acetate (VA/VAc) copolymer. *Id.* at 2, 3. The Office contends that Anelli also states that such polymeric compositions may further comprise "conventional additives such as stabilizers and plasticizers" *Id.* at 3. The Office concedes that "Anelli is silent as to

¹ The Office has again improperly relied upon U.S. Patent No. 6,577,796 ("the '796 patent") as prior art. For the reasons set forth in at least Applicants' prior responses dated April 24, 2008, and November 8, 2008, the '796 patent is not available as prior art under 35 U.S.C. § 103(c).

the specific stabilizer.” *Id.* In an effort to remedy this deficiency, the Office relies on Uemura and/or Kamachi. *Id.* According to the Office, Uemura and Kamachi disclose certain vinyl alcohol copolymers that are produced by the saponification (*i.e.*, hydrolysis) of vinyl esters in the presence of an antioxidant such as “IRGANOX 1098.” *Id.* at 3, 4.

Applicants respectfully disagree and traverse this rejection for the reasons of record and for at least the following reasons.

Several basic factual inquiries must be made in order to determine the obviousness or non-obviousness of claims of a patent application under 35 U.S.C. § 103. These factual inquiries, set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 U.S.P.Q. 459, 467 (1966), require the Examiner to:

- (1) Determine the scope and content of the prior art;
- (2) Ascertain the differences between the prior art and the claims in issue;
- (3) Resolve the level of ordinary skill in the pertinent art; and
- (4) Evaluate evidence of secondary considerations.

The obviousness or nonobviousness of the claimed invention is then evaluated in view of the results of these inquiries. *Graham*, 383 U.S. at 17-18, 148 U.S.P.Q. 467; see also *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1730, 82 U.S.P.Q.2d 1385, 1388 (2007).

Indeed, to establish a *prima facie* case of obviousness, the Examiner must:

make a determination whether the claimed invention “as a whole” would have been obvious at that time to that person. Knowledge of applicant’s disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the “differences,” conduct the search and evaluate the “subject matter as a whole” of the invention. The tendency to resort to “hindsight” based upon applicant’s

disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

M.P.E.P. § 2142. “The key to supporting any rejection under 35 U.S.C. § 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious.”

Id. It is important to note, moreover, that the prior art references relied upon in a rejection “must be considered in its entirety, *i.e.*, as a whole, **including portions that would lead away from the claimed invention**,” when such reasons are articulated by the Examiner. M.P.E.P. § 2141.03(VI) (second emphasis added); *see also Graham*, 383 U.S. at 17, 148 U.S.P.Q. 467.

Applicants respectfully submit that the Office has **still** not established a *prima facie* case of obviousness because there would have been no motivation to incorporate the antioxidants of Uemura or Kamachi for the stabilizers of Anelli and no reasonable expectation of success to arrive at Applicants’ claimed invention, when Uemura, Kamachi, and Anelli are considered **as a whole**.

A. The Combined References Fail to Teach or Suggest Each and Every Element of the Pending Claims

Applicants have previously argued that a person of ordinary skill in the art would not look to the teachings Anelli, in view of Uemura and Kamachi, because the stabilizers of Anelli serve their function after the VA/AVc copolymer has been manufactured, whereas the antioxidants of Uemura and Kamachi are taught to function during the production of a copolymer, not after the production of a copolymer. *See, e.g.*, April 24,

2008, Response, pages 14-16. This is an argument that the Office has never addressed or rebutted.

Implicit in the Office's analysis when determining whether an invention is obvious or nonobvious is the requirement that the Office show that each and every element of the rejected claims is disclosed in the prior art. M.P.E.P. § 2143.03. In the instant case, the Office has not established a *prima facie* case of obviousness, at least because Anelli and Uemura and/or Kamachi, whether considered alone or in combination, do not teach or suggest a process having each and every element of the pending claims. Specifically, both Uemura and Kamachi fail to teach or suggest that the antioxidants described therein can act as "hydrolysis stabilizers" in polymeric compositions comprising previously-manufactured VA/VAc copolymers, such as taught by Anelli.

The pending claims are directed to telecommunication cables and the problem of stabilizing (*i.e.*, preventing further saponification/hydrolysis) of a water-soluble polymeric composition comprising a vinyl alcohol/vinyl acetate copolymer and a plasticizer, and provides the solution by means of a hydrolysis stabilizer having specific molecular characteristics and added in a specific amount. This concept is embodied, for example, in claim 1, which recites, in part, a polymeric composition comprising (1) a hydrolysis stabilizer compound **and** (2) a vinyl alcohol/vinyl acetate copolymer **having a saponification degree** from about 60% to about 95% (*i.e.*, a previously-manufactured copolymer that exhibits a particular degree of hydrolysis).

Anelli discloses a product comprising a copolymer, a VA/VAc copolymer, wherein general stabilizers may be added in a sufficient amount to the already saponified copolymer to form its inventive product. See Anelli, page 10, lines 20-27 and page 18,

lines 1-8. In other words, the stabilizers of Anelli serve their undefined function after the vinyl alcohol/vinyl acetate copolymer product has been manufactured. In stark contrast, the antioxidants of Uemura and Kamachi are selected to be used during the production of a copolymer. This fact is supported, in part, by the Office's own stated understanding of Uemura and Kamachi. See Office Action at 3, 4 ("Uemura discloses ethylene-vinyl alcohol copolymers produced by saponification . . . in the presence of an antioxidant"); ("Kamachi discloses . . . copolymers . . . that are produced by a process that includes hydrolysis in the presence of an antioxidant").

Since the Irganox® 1098 of Uemura and Kamachi is taught only for the manufacture of their polymer, the combination of the teachings of Anelli, Uemura, and Kamachi is not a polymeric composition comprising (1) Irganox® 1098 of Uemura and Kamachi and (2) a saponified vinyl alcohol/vinyl acetate copolymer of Anelli. There is simply no teaching or suggestion in the cited art that Irganox® 1098 or a similar compound can be combined with an already saponified VA/VAc copolymer, such as the one described in Anelli, which would be required for obviousness. Accordingly, the combination of Anelli, Uemura, and Kamachi fail to teach or suggest each and every element of the pending claims.

For at least the foregoing reasons and those further discussed below, Applicants submit that the Office's rejection should be withdrawn.

B. There Is no Motivation to Combine the Teachings of Uemura and Kamachi with Anelli in the Manner Proposed by the Office

Similarly, the Office has not addressed Applicants' previous arguments that a person of ordinary skill in the art would not be motivated to combine the teachings of Anelli, Uemura, and Kamachi in the manner proposed, because the stabilizers of Anelli serve their function after the VA/AVc copolymer has been manufactured, whereas the antioxidants of Uemura and Kamachi function during the production of a copolymer, not after the production of a copolymer. See, e.g., April 24, 2008, Response, pages 4-5.

Specifically, since Uemura and Kamachi teach a use for their antioxidants that is wholly unrelated to the stabilization use addressed by the "stabilizers" in Anelli's compositions, a person of ordinary skill in the art seeking to prevent the further saponification/hydrolysis of VA/VAc copolymers would certainly not look to the antioxidants disclosed in Uemura and Kamachi, based on their teachings or that of Anelli. In short, Uemura and Kamachi fail to teach or suggest the use of the antioxidants identified therein as "hydrolysis stabilizers" in compositions comprising VA/VAc copolymers that were previously manufactured.

Applicants' position is further supported, in part, by the Office's prior reliance on Snow and its essential admission that the teachings of Uemura and Kamachi are inadequate in that the antioxidants described therein are not interchangeable with the stabilizers of Anelli. See July 25, 2008 Office Action (adding Snow to the response to Applicants' arguments of April 24, 2008). In view of that, and given the Office's current withdrawal of its prior rejections based on Snow, Applicants submit that the Office's instant rejection under 35 U.S.C. § 103(a) is improper.

For at least the foregoing reasons and those further discussed below, Applicants submit that the Office's rejection should be withdrawn.

C. Both Uemura and Kamachi Teach Away from the Claimed Compositions Because They Describe the Addition of Antioxidants that Promote the Hydrolysis of Vinyl Esters

The Office alleges that “[i]t would have been obvious to one having ordinary skill in the art to modify the teachings of Anelli by . . . including a known, commercially available antioxidant, with a reasonable expectation of obtaining the efficacious properties associated therewith.” Office Action at 4. Yet, the Office fails to consider what Uemura and Kamachi actually teach. Specifically, Uemura and Kamachi tout antioxidants such as Irganox® 1098 in the polymerization reaction for their ability not to “exert harmful influences upon the hydrolysis. . . .” See, Kamachi at col. 6, ll. 60-63; see also Uemura at col. 3, ll. 35-57. That is, both Uemura and Kamachi discuss the need for the complete polymerization *and* hydrolysis of vinyl ester copolymers, which may be achieved by adding antioxidants like Irganox® 1098 during the production of such copolymers. Yet, if the stabilizer of Anelli is to be a hydrolysis stabilizer, as claimed, one skilled in the art would not select a compound that the prior art taught would *not* “exert harmful influences upon the hydrolysis. . . .” For at least that reason and those further discussed below, Applicants submit that Uemura and Kamachi actually teach away from the addition of antioxidants such as Irganox® 1098 to the compositions of Anelli.

Uemura explains that “vinyl esters having a bulky group on the side chain . . . are barely hydrolyzed due to steric hindrance, and . . . under the conditions usually

employed . . . results in insufficient saponification.” Uemura at col. 3, ll. 35-42. In view of that, Uemura contends that “[i]t is of *primary importance* that the saponification be carried out in the absence of oxygen *or in the presence of an antioxidant*. *Id.* at col. 3, ll. 43-45 (emphasis added). According to Uemura, “[t]he antioxidant is not particularly limited as long as it does not act adversely to the saponification reaction . . . and is representatively exemplified by, for example, hindered phenol antioxidants,” such as Irganox® 1010 and Irganox® 1098. *Id.* at col. 3, l. 50 - col. 4, l. 13. According to Uemura, “[t]he higher the degree of saponification, the better the resistance to gas permeation.” *Id.* at col. 5, ll. 10-12. Hence, Uemura describes the use of antioxidants such as Irganox® 1098 as hydrolytic promoters that essentially counteract and/or inhibit the hindering effects that oxygen has on the saponification process.

Similarly, Kamachi discusses a “process for producing a vinyl alcohol polymer without decreasing the degree of polymerization during hydrolysis in the substantial absence of oxygen or the presence of an antioxidant.” Kamachi at col. 2, ll. 36-40. Indeed, Kamachi cautions that “[w]here hydrolysis is performed in the substantial presence of oxygen . . . a vinyl alcohol polymer *having a high degree of hydrolysis* and a high degree of polymerization *is difficult to be obtained*.” *Id.* at col. 6, ll. 51-59 (emphasis added). Kamachi indicates that the presence of oxygen can be eradicated by “[a]ny antioxidant . . . insofar as it does not exert harmful influences upon hydrolysis . . .” *Id.* at col. 6, ll. 60-64. According to Kamachi, exemplary antioxidants for accomplishing such include Irganox® 1010 and Irganox® 1098. *Id.* at col. 6, l. 65 - col. 7, l. 24. Therefore, like Uemura, Kamachi describes the use of antioxidants such as Irganox® 1098 to promote hydrolysis.

In sum, both Uemura and Kamachi describe the addition of antioxidants such as Irganox® 1010 and Irganox® 1098 during the production of certain vinyl esters in an effort to maximize hydrolysis and polymerization. That is, Uemura and Kamachi do not describe antioxidants like Irganox® 1098 as *hydrolysis stabilizers (i.e., protecting copolymers from further hydrolysis)*. Rather, Applicants submit that Uemura and Kamachi (either alone or in combination) actually teach away from the inclusion of their antioxidants, such as Irganox® 1098, in the compositions of Anelli. Accordingly, Applicants submit that a skilled artisan, making efforts to avoid or substantially reduce the hydrolysis of VA/VAc copolymers, would certainly not look to the hydrolysis-promoting antioxidants disclosed in Uemura and Kamachi.

Applicants acknowledge the Office's allegation that the teachings of Kamachi "would have suggested that [Irganox® 1098] is not merely used in the hydrolysis process, but that it is present in the final product to some degree to impart antioxidant properties." Office Action at 4. However, the Office has failed to provide any support for this assertion. Indeed, such a contention is baseless and wholly unsupported by the teachings of Kamachi, and thus, is improper for an office action. M.P.E.P. § 2144.03, *quoting In re Zurko*, 258 F.3d 1379, 1385 (Fed. Cir. 2001) ("[T]he Board cannot simply reach conclusions based on its own understanding or experience—or on its assessment of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings.").

Nevertheless, Applicants submit that even if the Office is correct that a portion is present in the final product, that cannot be a basis for combining the references. After all, a person of ordinary skill in the art looking to find a "hydrolysis stabilizer" (*i.e.*, a

compound that inhibits hydrolysis) for Anelli's compositions would not consider a compound that the prior art taught would not "exert harmful influences upon the hydrolysis. . . ." For at least that reason, Applicants respectfully submit that the Office's basis for a *prima facie* case of obviousness is incorrect and the rejection should be withdrawn.

D. The Hydrolysis Stabilizers of the Pending Claims Exhibit Unexpectedly Superior Properties when Compared to Compounds Falling Outside the Claim Scope

Even if, for argument's sake, a skilled artisan would be motivated to combine the teachings of either Uemura or Kamachi with those of Anelli, Applicants submit that compositions containing hydrolysis stabilizers within the scope of the pending claims have unexpectedly superior properties as compared to compositions containing stabilizers falling outside the scope of the claims. Indeed, "[e]vidence that a compound is unexpectedly superior in one of a spectrum of common properties . . . can be enough to rebut a *prima facie* case of obviousness." M.P.E.P. § 716.02(a), *citing In re Chupp*, 18 F.2d 643, 646 (Fed. Cir. 1987).

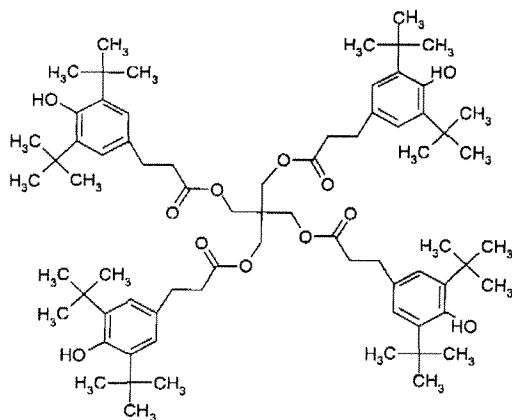
As previously discussed in Applicants' responses to at least the Office Actions of August 8, 2007, January 25, 2008, and January 23, 2009, Applicants have identified a number of arguments with respect to the unexpected and/or unpredictable nature of the hydrolysis stabilizers of the claimed compositions. However, the Office has never addressed or explained why those results are not surprising, unexpected, or otherwise not relevant to the patentability of the pending claims. For example, in response to the Office Action dated August 8, 2007, Applicants explained that compositions containing

stabilizers within the scope of the claims, such as Irganox® 1098, have unexpectedly superior properties as compared to compositions containing compounds such as Irganox® 1010, Irganox® 245, and Irganox® 259.

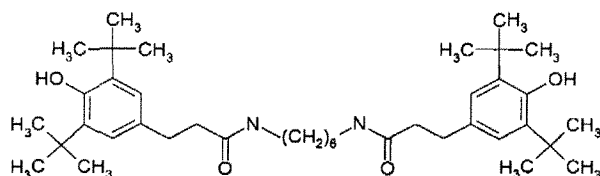
In support of that argument, Applicants note that Uemura teaches one skilled in the art that at least Irganox® 1098 and Irganox® 1010 are interchangeable. Uemura teaches that “[i]t is primarily important that the saponification be carried out in the absence of oxygen or in the presence of an antioxidant.” Uemura, col. 3, lines 43-45 (emphasis added). Furthermore, “[t]he antioxidant is not particularly limited as long as it does not act adversely to the saponification reaction . . . and is representatively exemplified by, for example, hindered phenol antioxidants,” such as Irganox® 1010 and Irganox® 1098. *Id.* at col. 3, line 50 – col. 4, line 13 (emphasis added).

In order to fully appreciate the chemical differences between Irganox® 1010 and Irganox® 1098, Applicants provide their respective molecular formulas:

Irganox® 1010



Irganox® 1098



While Uemura considers these hindered phenol antioxidants as equivalent antioxidants for the purposes of saponification of ethylene vinyl alcohol copolymers, Applicants discovered that these compounds are not interchangeable when used as hydrolysis stabilizers for VA-VAc copolymers.

Hence, the pending claims are directed to a water-soluble polymeric composition comprising, *inter alia*, “a hydrolysis stabilizer compound comprising a chelant group **comprising two hydrogen atoms bonded to two respective heteroatoms** selected from nitrogen, oxygen and sulphur, **said two hydrogen atoms having a distance between each other of from 4.2×10^{-10} m to 5.8×10^{-10} m**, preferably of from 4.5×10^{-10} m to 5.5×10^{-10} m.” See specification at page 3, lines 4-10 (emphasis added); see also claim 1. According to a non-binding hypothesis, Applicants believe that such distance “is capable of effectively interacting with the polymeric chain of the VA-VAc copolymer in order to limit the hydrolysis of the residual acetate groups.” *Id.* at 10, lines 17-20.

As previously discussed, the distance between the hydrogen atoms of -NH- in Irganox® 1098 is 5.0×10^{-10} m, while the distance between the hydrogen atoms of -C(OH)- is 8.7 to 10.5×10^{-10} m in Irganox® 1010, which is outside the recited range of claim 1. Table 2 of the present application shows the effectiveness of a hydrolysis stabilizer according to the invention (composition 1, containing Irganox® 1098) versus compounds having hydrogen distance outside of the claimed range, including Composition 5, which contains Irganox® 1010 and had the worst reported value. This experimental data unequivocally demonstrates that hydrolysis stabilizers within the scope of the claims, such as Irganox® 1098, are **unexpectedly superior** to compounds that are outside the scope of the claims, such as Irganox® 1010.

This fact is not predicted or appreciated by any of the references cited by the Office, including Uemura and Kamachi, which describe Irganox® 1098 and Irganox® 1010 as equivalent antioxidants. See, e.g., Uemura, *supra*; and Kamachi at col. 6, line 65 – col. 7, line 24 (listing both Irganox® 1010 and Irganox® 1098 as examples of suitable antioxidants).

If, as the Office suggests, it would have been obvious to combine either Uemura or Kamachi with Anelli, a person of ordinary skill in the art would expect that antioxidants such as Irganox® 1010 and Irganox® 1098 would have the same, or at least substantially similar, effects on vinyl ester hydrolysis. However, as noted above, Irganox® 1098 exhibits stabilizing properties that are unexpectedly superior to those of Irganox® 1010. Specifically, the composition containing Irganox® 1098 exhibits a mere **6.3%** variation of saponification number when compared to the **14.8%** variation in the same composition substituted with Irganox® 1010, representing a difference in variation of greater than 100%. Similar differences in variation are seen between Irganox® 1098 and the other antioxidants tested. See specification at 20, Table 2.

For at least the foregoing reasons, Applicants submit that the hydrolysis stabilizers of the pending claims are unexpectedly superior when compared to the antioxidants disclosed in Uemura and Kamachi that fall outside the pending claim scope. They are not interchangeable as Uemura teaches. Accordingly, Applicants submit that a *prima facie* case of obviousness has not been established and the rejection should be withdrawn.

III. CONCLUSION

In view of the foregoing amendments and remarks, Applicants respectfully request reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to Deposit Account No. 06-0916.

Respectfully submitted,

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